



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET  
RICHMOND, 23219-2000

**CHARLES D. NOTTINGHAM**  
COMMISSIONER

**J. T. MILLS**  
STATE LOCATION AND DESIGN ENGINEER

September 27, 2000

Mr. Mark T. Mansfield  
CIDMA expansion Project Manager  
U. S. Army Corps of Engineers, Norfolk District  
Fort Norfolk  
803 Front Street  
Norfolk, Virginia 23510

Dear Mr. Mansfield:

Earlier this month representatives from the U. S. Corps of Engineers, Virginia Port Authority and Virginia Department of Transportation (VDOT) met to discuss the Craney Island Disposal Management Area (CIDMA) expansion plans, the Fourth Marine Terminal and the Hampton Roads Crossing (HRCS) project.

As a result of information presented by your staff and the close relationships between all three projects, we had our consultant review all current CIDMA expansion options for compatibility with the Third Crossing. I have enclosed their findings and note that Options 1-6, 8-12 all have significant adverse impacts on the Third Crossing. Only Option 7, the eastward expansion option, appears not to adversely effect the Hampton Roads Third Crossing.

If you have any questions please feel free to contact Jeff Cutright at 804-225-4958. Thank you for the opportunity to provide feedback on this important project.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. T. Mills".

J. T. Mills  
State Location and Design Engineer

Enclosures (2)

# Review comments matrix: Craney Island Expansion Study Plans Impacts on 3rd Crossing

| OPTION | EXPANSION SIDE | PORT LOCATION | DESIGN DEFICIENCIES |          |             |                |
|--------|----------------|---------------|---------------------|----------|-------------|----------------|
|        |                |               | HORIZONTAL          | VERTICAL | PORT ACCESS | GEOTECHNICAL * |
| 1      | N & W          | E             |                     |          |             |                |
| 2      | N & W          | E             |                     |          |             |                |
| 3      | W              | E             |                     |          |             |                |
| 4      | W              | E             |                     |          |             |                |
| 5      | W              | E             |                     |          |             |                |
| 6      | N              | N             |                     |          |             |                |
| 7      | E              | E             |                     |          |             |                |
| 8      | N & E          | E             |                     |          |             |                |
| 9      | N & E          | N & E         |                     |          |             |                |
| 10     | None           | E             |                     |          |             |                |
| 11     | N              | E             |                     |          |             |                |
| 12     | N              | E             |                     |          |             |                |

Significant adverse impact to operation of the 3rd Crossing

\* Dramatically increases risk of significant adverse impacts

***Further explanation of the design deficiencies is included in the attached report.***

## **Review comments on the *Concept Study Plans for Norfolk Harbor and Channels Eastward Expansion of Craney Island* with regard to the impacts on the study plans for the location, design and operation of the 3<sup>rd</sup> Crossing**

**By:** Michael Baker Jr. Inc.  
**For:** The Virginia Department of Transportation  
**Date:** September, 2000

The following comments were developed based upon a review conducted on a set of undated, 1"=2000' scale plans, labeled Option 1 through 12 for the *Norfolk Harbor and Channels Eastward Expansion of Craney Island Feasibility Study* received from the Army Corps of Engineers. This review was based solely on each option's impact on the planned Hampton Roads 3<sup>rd</sup> Crossing (3<sup>rd</sup> Crossing) and not the Craney Island disposal area or any future port facilities other than potential roadway access.

For the purposes of this review the section of the 3<sup>rd</sup> Crossing that connects Norfolk to I-664 is identified as the Intermodal Connector (IMC) and the north / south roadway which connects the IMC to Route 164 in Portsmouth shall be referred to as the Craney Island Connector (CIC).

### **Horizontal Geometric Concerns:**

*Applies to Options 1, 2, 3, 4, 5, 10, 11 & 12*

The close proximity of the CIC/IMC interchange to the I-664/IMC interchange will create significant operational difficulties. The entrance ramp to exit ramp distance between the northbound CIC ramp to westbound IMC and the eastbound IMC ramp to southbound CIC is only 1500'. The American Associations of State Highway and Transportation Officials (AASHTO) in their *Policy on Geometric Design of Highway and Streets* list a minimum of 2000' for a simple entrance – exit weave on a full freeway system to service interchange. The HOV lanes on the IMC worsen this inadequate weave distance. The concepts, as presented, place two gore areas (ramp junctions) in the same proximity, making for an unsafe situation. Four distinct weave movements would be occurring within this 1500'.

The preliminary layout for the 3<sup>rd</sup> Crossing has a 2800' weave distance from the entrance ramp to the first exit ramp gore area and an additional 1900' to the second exit. No consideration would be given to reducing this distance during final design.

### **Vertical Geometric Concerns:**

*Applies to Options 1, 2, 3, 4, 5, 8, 10, 11 & 12*

It is our understanding that the ultimate elevation of the Craney Island Disposal area will be 55 feet above mean sea level. The 3<sup>rd</sup> Crossing base elevation of bridges over water is planned at elevation 17.25'. This is the same elevation as the Monitor Merrimac Memorial as well as the I-64 over the water bridges. Considering the interchange and under bridge clearance requirements, the uppermost ramp of the CIC/IMC interchange would need to be approximately 100 feet above the water. Regardless of the significant increase in construction cost, it would be physically impossible to rise up under the Elizabeth River or to drop down to I-664 to make these connections from this height.

If Craney Island is to remain a viable dredge disposal site with a 55-foot ultimate top elevation, all options, which traverse the site, will have to consider it's operational requirements. That is to provide a free flow of dredge material and equipment transversely across the Island. To allow trucks to pass below the CIC the elevated bridge structure roadway surface would have to be at approximately elevation 75 feet, which is not practical.

## **Inability to Provide Access to the Proposed Port:**

### ***Applies to Options 6 & 9***

Because of the requirements of controlled access on the IMC and the close proximity of interchanges, direct access to the proposed port facilities located on the north side of the IMC can not be made.

The options that provide the best roadway geometry, both horizontally and vertically, are Options 7 & 8.

## **Geotechnical Considerations:**

### ***Applies to Options 1, 2, 3, 4, 5, 8, 10, 11 & 12***

All the bridges of the 3rd Crossing will be supported on piles driven into the riverbed. However, the underlying soils in and around Craney Island consist of a varying but relatively deep layer of clay. Based upon extensive geological investigations and analysis undertaken by the Army Corps of Engineers (ACOE) these clay layers are very compressible. Therefore, under a highly loaded situation, given that the pore pressure is relieved, significant settlements to the overburden or placed fill as well as to the underlying soils can result. We are concerned that if high levels of fill were to be later placed under or near the bridge structures, the ground could subside and thus have a detrimental or perhaps catastrophic affect on the bridge structures.

A trial conducted by ACOE placed a grid of wick drains within a small area of one of the containment cells. The purpose of the wick drains was to relieve the observed high pore pressure ( "trapped water" ) in the underlying clays. Within a few months the test area subsided approximately 10 feet without additional fill placement.